IN THE CLAIMS

What is claimed is:

1. A method of assigning a downlink channel to a mobile station registered with a base station, comprising the steps of:

    a) turning off pilot tones being transmitted by a plurality of active mobile stations registered with the base station, each turned off pilot tone corresponding to an assigned downlink channel;

    b) paging the mobile station with a pending traffic packet from the base station;

    c) performing interference sensing at the base station to identify interference-free downlink channels;

    d) assigning, at the base station, a downlink traffic channel to the mobile station to receive the pending packets; and

    e) transmitting the downlink channel assignment from the base station to the mobile station.

2. The method of claim 1, wherein downlink channels are assigned to a plurality of mobile stations registered with the base station.

3. The method of claim 1, wherein there are a plurality of base stations and steps a) - e) are performed successively for each of the plurality of base stations.

4. A method of assigning an uplink channel to a mobile station registered with a base station, comprising the steps of:

    a) turning off pilot tones being transmitted by the base station, each pilot tones corresponding to an uplink channel assigned to one of a plurality of active mobile stations registered with the base station;

    b) requesting access from the mobile station for a traffic packet;

    c) performing interference sensing at the plurality of active mobile stations to identify interference-free uplink channels;

    d) transmitting from each one of the plurality of active mobile stations a list of uplink channels identified as being acceptably interference-free;

    e) assigning, at the base station, an uplink channel to the mobile station; and

    f) transmitting the uplink channel assignment from the base station to the mobile station.

5. The method of claim 4, wherein uplink channels are assigned to a plurality of mobile stations registered with the base station.

6. The method of claim 4, wherein there are a plurality of base stations and steps a) - f) are performed successively for each of the plurality of base stations.

7. A method of assigning an uplink channel and a downlink channel to a mobile station registered with a base station, comprising the steps of:

a) turning off pilot tones being transmitted by a plurality of active mobile stations registered with the base station, each turned off pilot tone corresponding to an assigned downlink channel;

b) turning off pilot tones being transmitted by the base station, each pilot tones corresponding to an uplink channel assigned to one of the plurality of active mobile stations registered with the base station;

c) paging the mobile station with a pending traffic packet from the base station;

d) requesting access from the mobile station for a traffic packet;

e) performing interference sensing at the base station to identify interference-free downlink channels;

f) performing interference sensing at the plurality of active mobile stations to identify interference-free uplink channels;

g) transmitting from each one of the plurality of active mobile stations a list of uplink channels identified as being acceptably interference-free;

h) assigning, at the base station, a downlink traffic channel to the mobile station to receive the pending packets;

i) assigning, at the base station, an uplink channel to the mobile station; and

j) transmitting the downlink channel assignment and the uplink channel assignment from the base station to the mobile station.

8.   The method of claim 7, wherein downlink channels and uplink channels are assigned to a plurality of mobile stations registered with the base station.

9.   The method of claim 7, wherein there are a plurality of base stations and steps a) - j) are performed successively for each of the plurality of base stations.

10.   A system for assigning a downlink channel to a mobile station registered with a base station, comprising:

means for turning off pilot tones being transmitted by a plurality of active mobile stations registered with the base station, each turned off pilot tone corresponding to an assigned downlink channel;

means for paging the mobile station with a pending traffic packet from the base station;

means for performing interference sensing at the base station to identify interference-free downlink channels;

means for assigning, at the base station, a downlink traffic channel to the mobile station to receive the pending packets; and

means for transmitting the downlink channel assignment from the base station to the mobile station.

11.   The system of claim 10, wherein downlink channels are assigned to a plurality of mobile stations registered with the base station.

12.   The system of claim 10, wherein there are a plurality of base stations and the system operates on each of the plurality of base stations.

13. A system for assigning an uplink channel to a mobile station registered with a base station, comprising:

means for turning off pilot tones being transmitted by the base station, each pilot tones corresponding to an uplink channel assigned to one of a plurality of active mobile stations

5 registered with the base station;

means for requesting access from the mobile station for a traffic packet;

means for performing interference sensing at the plurality of active mobile stations to identify interference-free uplink channels;

means for transmitting from each one of the plurality of active mobile stations a list of

10 uplink channels identified as being acceptably interference-free;

means for assigning, at the base station, an uplink channel to the mobile station; and

means for transmitting the uplink channel assignment from the base station to the mobile station.

15 14. The system of claim 13, wherein downlink channels are assigned to a plurality of mobile stations registered with the base station.

15. The system of claim 13, wherein there are a plurality of base stations and the system operates on each of the plurality of base stations.

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16. A system for assigning an uplink channel and a downlink channel to a mobile station registered with a base station, comprising:

means for turning off pilot tones being transmitted by a plurality of active mobile stations registered with the base station, each turned off pilot tone corresponding to an assigned downlink

25 channel;

means for turning off pilot tones being transmitted by the base station, each pilot tones corresponding to an uplink channel assigned to one of the plurality of active mobile stations registered with the base station;

means for paging the mobile station with a pending traffic packet from the base station;

30 means for requesting access from the mobile station for a traffic packet;

means for performing interference sensing at the base station to identify interference-free downlink channels;

means for performing interference sensing at the plurality of active mobile stations to identify interference-free uplink channels;

35 means for transmitting from each one of the plurality of active mobile stations a list of uplink channels identified as being acceptably interference-free;

means for assigning, at the base station, a downlink traffic channel to the mobile station to receive the pending packets;

means for assigning, at the base station, an uplink channel to the mobile station; and

40 means for transmitting the downlink channel assignment and the uplink channel assignment from the base station to the mobile station.

17. The system of claim 16, wherein downlink channels and uplink channels are assigned to a plurality of mobile stations registered with the base station.

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18.   The system of claim 16, wherein there are a plurality of base stations and the system operates on each of the plurality of base stations.

19.   A computer program product for assigning a downlink channel to a mobile station registered with a base station, comprising:
        a computer readable medium;
        computer program instructions, recorded on the computer readable medium, executable by a processor, for performing the steps of:
        a) turning off pilot tones being transmitted by a plurality of active mobile stations registered with the base station, each turned off pilot tone corresponding to an assigned downlink channel;
        b) paging the mobile station with a pending traffic packet from the base station;
        c) performing interference sensing at the base station to identify interference-free downlink channels;
        d) assigning, at the base station, a downlink traffic channel to the mobile station to receive the pending packets; and
        e) transmitting the downlink channel assignment from the base station to the mobile station.

20.   The computer program product of claim 19, wherein downlink channels are assigned to a plurality of mobile stations registered with the base station.

21.   The computer program product of claim 19, wherein there are a plurality of base stations and steps a) - e) are performed successively for each of the plurality of base stations.

22.   A computer program product for assigning a uplink channel to a mobile station registered with a base station, comprising:
        a computer readable medium;
        computer program instructions, recorded on the computer readable medium, executable by a processor, for performing the steps of:
        a) turning off pilot tones being transmitted by the base station, each pilot tones corresponding to an uplink channel assigned to one of a plurality of active mobile stations registered with the base station;
        b) requesting access from the mobile station for a traffic packet;
        c) performing interference sensing at the plurality of active mobile stations to identify interference-free uplink channels;
        d) transmitting from each one of the plurality of active mobile stations a list of uplink channels identified as being acceptably interference-free;
        e) assigning, at the base station, an uplink channel to the mobile station; and
        f) transmitting the uplink channel assignment from the base station to the mobile station.

23.   The computer program product of claim 22, wherein downlink channels are assigned to a plurality of mobile stations registered with the base station.

24.   The computer program product of claim 22, wherein there are a plurality of base stations and steps a) - f) are performed successively for each of the plurality of base stations.

25.   A computer program product for assigning an uplink channel and a downlink channel to a mobile station registered with a base station, comprising:
          a computer readable medium;
          computer program instructions, recorded on the computer readable medium, executable by a processor, for performing the steps of:
          a) turning off pilot tones being transmitted by a plurality of active mobile stations registered with the base station, each turned off pilot tone corresponding to an assigned downlink channel;
          b) turning off pilot tones being transmitted by the base station, each pilot tones corresponding to an uplink channel assigned to one of the plurality of active mobile stations registered with the base station;
          c) paging the mobile station with a pending traffic packet from the base station;
          d) requesting access from the mobile station for a traffic packet;
          e) performing interference sensing at the base station to identify interference-free downlink channels;
          f) performing interference sensing at the plurality of active mobile stations to identify interference-free uplink channels;
          g) transmitting from each one of the plurality of active mobile stations a list of uplink channels identified as being acceptably interference-free;
          h) assigning, at the base station, a downlink traffic channel to the mobile station to receive the pending packets;
          i) assigning, at the base station, an uplink channel to the mobile station; and
          j) transmitting the downlink channel assignment and the uplink channel assignment from the base station to the mobile station.

26.   The computer program product of claim 25, wherein downlink channels and uplink channels are assigned to a plurality of mobile stations registered with the base station.

27.   The computer program product of claim 25, wherein there are a plurality of base stations and steps a) - j) are performed successively for each of the plurality of base stations.

28. A method for medium access control for uncoupled downlink and uplink channel assignment, comprising:

assigning a base station a frame within a periodic super-frame during which it transmits;

transmitting narrow-band pilot tones from the base station, corresponding to assigned traffic channels between base station and their mobiles;

scanning the tones from the base station by mobiles and reporting a list of channels with low interference back to the base station;

said scanning being in a staggered order to avoid contention for a same channel between mutually interfering base stations with concurrent traffic; and

5   selecting at the base station a channel and notifying the mobile.

29. A system for medium access control for uncoupled downlink and uplink channel assignment, comprising:

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a base station having an assigned frame within a periodic super-frame during which it transmits;

said base station transmitting narrow-band pilot tones, corresponding to assigned traffic channels between the base station and mobile stations;

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a mobile station scanning the tones from the base station by mobiles and reporting a list of channels with low interference back to the base station;

said scanning being in a staggered order to avoid contention for a same channel between
20   mutually interfering base stations with concurrent traffic; and

said base station selecting a channel and notifying the mobile.